



**SLOVENSKI STANDARD**  
**kSIST-TP FprCEN ISO/TR 8546:2022**  
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**Zaščita za roke - Navodila za izbiro in uporabo (ISO/PRF TR 8546:2022)**

Hand protection - Guidance for selection and use (ISO/PRF TR 8546:2022)

Handschutz - Leitfaden für Auswahl und Gebrauch (ISO/PRF TR 8546:2022)

Protection de la main - Recommandations pour la sélection et l'utilisation (ISO/PRF TR 8546:2022)

Ta slovenski standard je istoveten z: **FprCEN ISO/TR 8546**

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13.340.40 Varovanje dlani in rok Hand and arm protection

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TECHNICAL  
REPORT

ISO/TR  
8546

First edition

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**Hand protection — Guidance for  
selection and use**

*Protection de la main — Conseils pour la sélection et l'utilisation*

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## ISO/TR 8546:2022(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 13, *Protective clothing*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Any feedback or questions on this document can be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

For the past year a push has taken place to align EN and ISO standards. Currently some are covered by a single standard, others are identical, but not yet as an EN ISO standard, others have not been developed as ISO or CEN standard. The table below describes the state of the various standards.

EN Standard	ISO Standard	Future state
EN ISO 21420:2010	ISO 21420:2020	same
EN ISO 374-1:2016+A1:2018	ISO 374-1: 2016 + Amd 1:2018	same
EN 374-2:2014	ISO 374-2:2019	Already equivalent, but single standard as EN ISO
EN 374-4:2013	ISO 374-4:2019	Already equivalent, but single standard as EN ISO
EN ISO 374-5:2016+A1:2018	ISO 374-5:2016	same
EN ISO 374-6	ISO 374-6	joint project in preparation
EN 388:2016+A1:2018	ISO 23388:2018	Already equivalent, but single standard as EN ISO
EN 407:2020+A1:2021	ISO 23407:2021	Already equivalent, but single standard as EN ISO
No CEN equivalent	ISO 18889	EN ISO 18889 once adopted
EN ISO 19918	ISO 19918	same
EN 16523-1:2015 (liquid permeation) EN 16523-2:2015 (gas permeation) <i>Replaced EN 374-3</i>	not equivalent to ISO 6529 but many similarities	Revision of ISO 6529 will more closely align ISO with EN
EN 16530:2016 (electrostatic)	No ISO equivalent	TBD
EN 16778: 2016 (DMFA concentration)	No ISO equivalent	TBD
EN 12477:2001 + A1:2005 (welder)	No ISO equivalent	TBD
EN 511:2006	No ISO equivalent	TBD
EN 659:2003 +A1:2008	ISO 15383:2001 ISO 11999-4:2015	Revision of EN 659 will more closely align EN with ISO
No CEN equivalent	ISO 16073-4:2019	Revision of EN 659 will more closely align EN with ISO
No CEN equivalent	ISO 18639-4:2018	Revision of EN 659 will more closely align EN with ISO
		TBD to be decided

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# Hand protection — Guidance for selection and use

## 1 Scope

This document gives information on the selection and use of personal protective equipment for the hand protection.

The application of this document requires that the risk assessment has been carried out and the hazards have been minimized accordingly through substitution and technical and organizational measures.

On this basis, this document contains information that supports employers in counteracting certain risks to hands that could not be sufficiently reduced by substitution and technical and organizational measures by selecting and using suitable protective gloves.

This document provides explanations on selection, usage and training applicable to protective gloves. The explanations concerning specific hazards are provided in annexes.

This guidance considers the following risks:

- mechanical, (see [Annex A](#));
- chemical, (see [Annex B](#));
- biological, (see [Annex C](#));
- thermal, (see [Annex D](#) and [E](#));
- electrostatic discharge (see [Annex F](#));
- ionizing radiation and radioactive contamination (see [Annex G](#)).

This guidance does not cover other risks, because pertinent international or national publications are available or because the relevant information was not available in ISO/TC 94/SC 13/WG 8. Risks not covered include e.g.:

- cuts and stabs by hand knives;
- use of chain saws (covered by ISO 11393-4:2018, Annex A);
- animal bites;
- needlesticks;
- electrocution;
- optical radiation;
- vibrations;
- electric fault arcs;
- firefighting (covered by ISO/TR 21808);
- sport.

## 2 Normative references

There are no normative references in this document.

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### 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 4 Selection

#### 4.1 General principles

In most countries, manufacturing of gloves is subject to specific legislation, e.g. concerning personal protective equipment, medical devices, etc. Adequate design and construction ensures that a protective glove:

- is appropriate for the risks involved, without itself leading to any increased risk, e.g. entanglement on rotating parts, entrapment, formation of ignition sparks;
- corresponds to existing conditions at the workplace, e.g. grip, tactile sensitivity, waterproofness, breathability, visibility;
- takes account of ergonomic requirements and the worker's state of health, e.g. size, fit, potential allergens.

As a principle, a protective glove is intended for personal use. If the circumstances require that personal protective equipment is used by several persons (e.g. metal ring mesh glove, glovebox), this results in additional hygiene requirements.

Important instructions for the safe use of protective gloves can be found in the supplied manufacturer's instructions and information. The advertised performance levels were achieved under laboratory conditions performed on unused gloves and cannot necessarily be transferred to the actual conditions of use. More detailed information can be obtained from the manufacturers.

Practical tests are a prerequisite for the selection of suitable protective gloves. Criteria for the selection of protective gloves are not only the best possible protection but also ergonomic factors such as wearing comfort, tactile sensitivity and grip. Physiological factors such as wearing comfort, sensitivity or sweat development can be tested in wear tests.

The dexterity of the fingers and the ability to pick up, hold and/or operate objects safely are limited by the wearing of protective gloves. The better the flexibility of the glove and the coefficient of friction of the gripping surfaces are adapted to the geometry and surface characteristics of the objects to be handled, the greater the grip safety for the user.

Only on the basis of the risk assessment is it possible to select the protective glove actually suitable for a particular activity.

A protective glove is suitable if

- a) it meets the legal requirements (for example in Europe CE marking),
- b) it is accompanied by the manufacturer declaration of conformity,
- c) it is capable of reducing the risk to the user to an acceptable level throughout the period of use, and
- d) it can be used under the given working conditions.

NOTE Any modification to the glove requires formal approval by the manufacturer.

## 4.2 Selection in function of specific hazards

With regard to the hazards covered by the scope of this document, annexes dealing with those specific hazards provide the information required to make the selection correctly.

## 4.3 Combination with other PPE

The combination of PPE only protects the user if a seamless transition between the equipment parts is ensured. This can be achieved by these methods, for example

- adequate cuff length,
- adequate arm protectors,
- connection with a protective suit, e.g. glove adapter, taping, and
- sleeve design of the protective suit, e.g.: thumb loop, throw-on sleeves.

## 4.4 Wearing trials

Wearing trials can be used to assess the ergonomic and workplace-specific suitability of the protective gloves, including for example

- Ease and speed of putting on and taking off the gloves,
- comfort, e.g. sweating, flexibility, disturbing seams,
- compatibility with all other PPE items,
- ability to perform all expected tasks without hindrance and without difficulty, e.g. secure grip, tactile sensitivity, and
- maintaining protection in all working positions, e.g. covering with the sleeve.

A systematic approach to carrying out the wearer trials includes, for example

- selection of the participants according to a cross-section of the respective occupational group (height, weight, age, gender, etc.),
- structured collection of feedback for evaluation, so that both qualitative and quantitative data collection and analysis are possible; this can be achieved by using a structured questionnaire, structured or semi-structured interviews and/or group discussions, and
- sufficient number of participants to ensure an appropriate selection of suitable protective gloves for all affected employees in a work area.

## 4.5 Sweating

Sweating when wearing liquid-tight gloves for long periods of time, through heavy physical activity and/or high ambient temperatures can lead to skin reddening, softening and irritations. Gloves designed with a knitliner or flocklining, wearing a textile underglove or changing gloves frequently help providing added comfort and preserve the highest integrity of the gloves. Regular skin care can help to reduce the negative effects of skin softening (e.g. after work cream).

## 4.6 Allergens

According to ISO 21420, the manufacturer provides the user on request with a list of substances contained in a glove that are known to cause allergies. In the case of gloves containing natural rubber, the information for use include a warning which read something like this: "The glove contains natural rubber which may cause allergic reactions".

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### 5 Usage

#### 5.1 Testing before use or re-use

By checking the protective gloves before use or re-use (e.g. visual assessment of the surface condition of the barrier), hazards due to possible damage, quality defects, and flaws such as tear, abraded areas, holes or cracks, especially in finger crotches, broken seams or other defects can be identified. The protective effect can be reduced e.g. by pointed objects, soot or heat-induced material embrittlement. Wet gloves, be it inside or outside, may have reduced performance levels and cause skin discomfort. Skin discomfort can also be caused when gloves are worn on wet or dirty hands.

Checking the protective gloves before use also helps to determine whether their expiry date has already passed.

Only fitting gloves (correct size) offer the intended protective performance and suitability.

#### 5.2 Use

Important instructions for the safe use of protective gloves can be found in the supplied manufacturer's instructions and information.

According to ISO 21420, the manufacturer provides the user with instructions together with the gloves containing all relevant information for safe use. Whether the glove is designed for single use or might be reused is an important instruction to be followed.

Employers are responsible of giving appropriate and understandable instructions to the workers. At the same time, workers are responsible of making correct use of the personal protective equipment supplied to them in accordance with the training and the instructions given by their employer.

### 6 Training

Training of employees/users in the correct handling of their protective gloves is a prerequisite for their correct use. Providing only written instructions or information without practical demonstrations, training and exercises may not be sufficient.

Important instructions for the safe use of protective gloves can be found in the supplied manufacturer's instructions and information. This can include

- information on why the protective gloves can be worn,
- information on personal responsibility for correct use and care, and
- information about the limitations and possibilities of the protective gloves:
  - what they can protect against;
  - what they do not protect against;
- how to don, use/wear and doff the protective gloves;
- how to store the protective gloves when not in use;
- information on precautions for cleaning;
- how to determine when the protective gloves are no longer appropriate and can be disposed of;
- procedures for the environmentally sound disposal of gloves which are no longer fit for use;
- how to obtain replacement;
- emergency response.